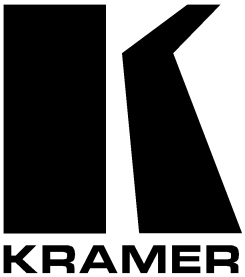
Kramer Electronics, Ltd.



USER MANUAL

Model:

VM-10xl

Video Audio Distribution Amplifier

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer **VM-10xl** *Video Audio Distribution Amplifier.* The **VM-10xl** is ideal for:

- Audio video duplication studios
- Rental/staging, CCTV, and home theater use

Each package includes the following items:

- **VM-10xl** Video Audio Distribution Amplifier
- Power cord
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

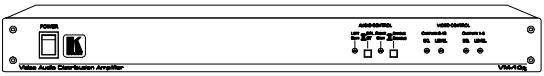
1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

Step 1: Mount the machine - see section 5

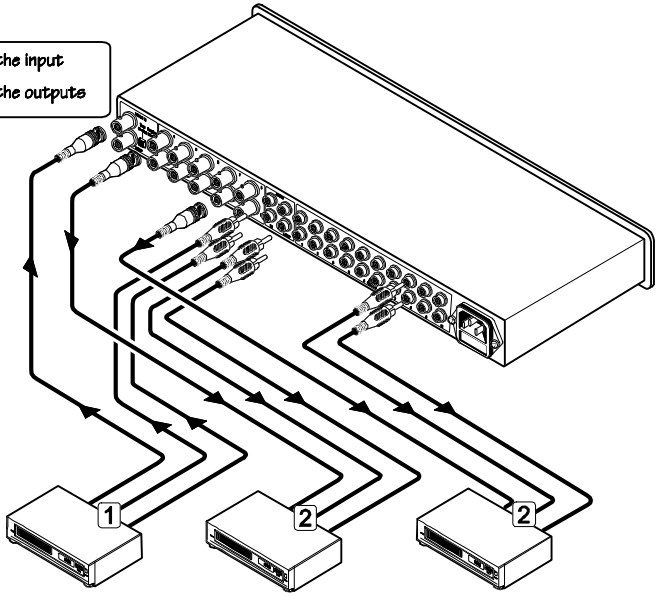
Mount the machine in a rack or stick the 4 rubber feet to the underside



Step 2: Connect the input and outputs - see section 6

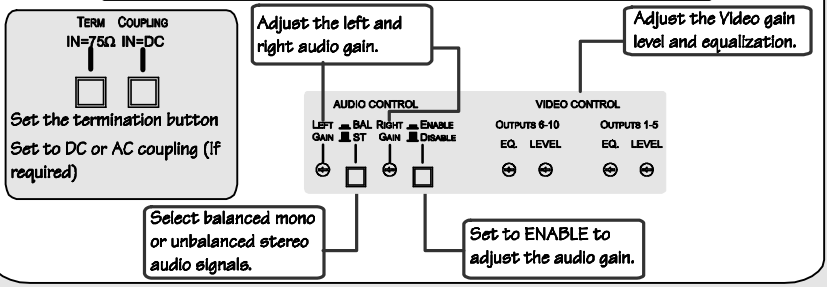
1 Connect the input

2 Connect the outputs



Step 3: Connect the power

Step 4: Set the machine - see section 6


TERM COUPLING
IN=75Ω IN=DC
Set the termination button
Set to DC or AC coupling (if required)
Adjust the left and right audio gain.
Adjust the Video gain level and equalization.
AUDIO CONTROL
LEFT GAIN
BAL ST
RIGHT GAIN
ENABLE DISABLE
VIDEO CONTROL
OUTPUTS 6-10 EQ. LEVEL
OUTPUTS 1-5 EQ. LEVEL
Select balanced mono or unbalanced stereo audio signals.
Set to ENABLE to adjust the audio gain.

3 Overview

The **VM-10xl** is a high quality 1:10 video audio distribution amplifier using BNC connectors for composite video, and RCA connectors for unbalanced stereo audio signals. The **VM-10xl** accepts a composite video input and distributes the signal to 10 identical outputs.

In particular, the **VM-10xl**:

- Includes looping connectors for connecting to a local monitor, other acceptor, or for forming larger systems[1]
- Has a video bandwidth of 360MHZ, ensuring transparent performance with typical video and audio sources
- Can function as unbalanced stereo audio or balanced[2] mono audio (selected via an audio control button)
- Can output video signals that are DC or AC coupled for maximum flexibility (selected via a coupling button)
- Has front panel video trimmer controls[3] for output level and cable equalization (EQ.), as well as audio trimmer controls for left and right gain, with an enable / disable control button

Achieving the best performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances and positioning your **VM-10xl** away from moisture, excessive sunlight and dust

4 Your VM-10xl Video Audio Distribution Amplifier

Figure 1 and Table 1 define the **VM-10xl** *Video Audio Distribution Amplifier*:

1 For example, you can connect 3 VM-10xl units to make a 1:30 video audio distribution amplifier. See section 6.2 for details

2 Recommended for low signal transmission over long distances or in audio broadcasting studios for high quality signal recreation

3 The video outputs are arranged in two blocks of 5 outputs (outputs 1 to 5, and outputs 6 to 10). Each block can be separately trimmed for output level and cable equalization (EQ.) thus achieving different compensations for different cable lengths

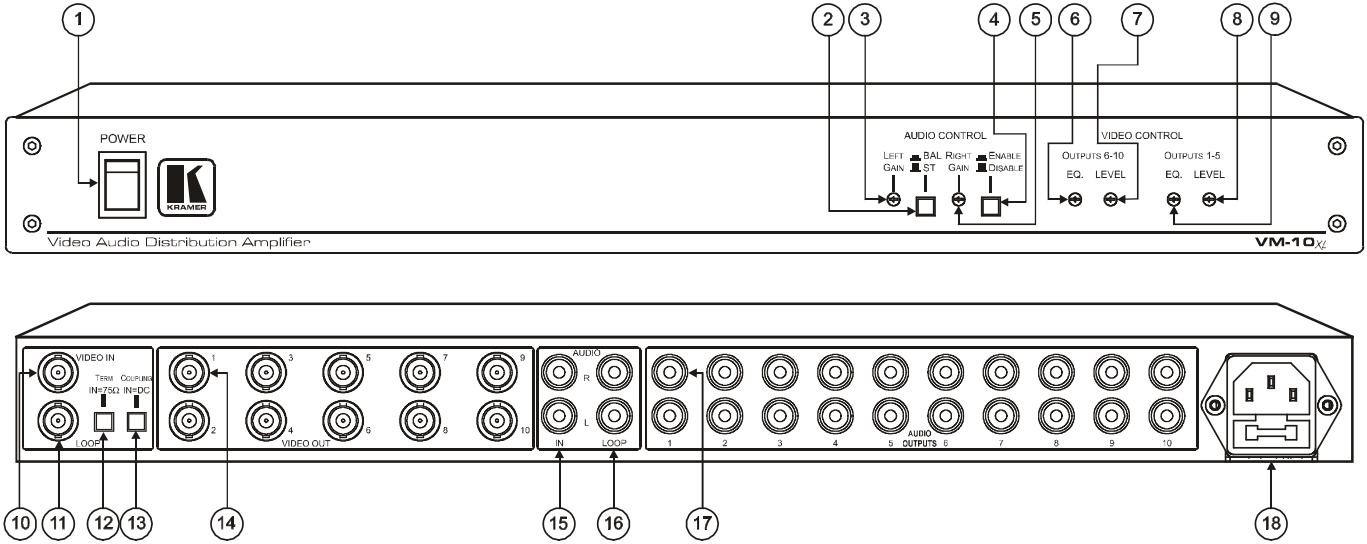


Figure 1: VM-10xl Video Audio Distribution Amplifier

Table 1: Front Panel VM-10xl Video Audio Distribution Amplifier Features

#	Feature		Function
1	*POWER* Switch		Illuminated switch supplying power to the unit
2	*AUDIO CONTROL*	*BAL/ST* Button	Pushing in selects balanced mono audio operation, releasing selects unbalanced stereo audio operation
3		*LEFT GAIN* Trimmer	Adjusts[1] the audio signal level for the left channel
4		Enable/Disable Button	Pushing in enables audio gain trimmer control, releasing bypasses it disabling audio gain trimmer control
5		*RIGHT GAIN* Trimmer	Adjusts[1] the audio signal level for the right channel
6	*VIDEO CONTROL*	*EQ.* Trimmer	Adjusts[1] the video EQ. (equalization) compensation of outputs 6 to 10
7		*LEVEL* Trimmer	Adjusts[1] the video signal level of outputs 6 to 10
8		*LEVEL* Trimmer	Adjusts[1] the video signal level of outputs 1 to 5
9		*EQ.* Trimmer	Adjusts[1] the video EQ. (equalization) compensation of outputs 1 to 5

Table 2: Rear Panel VM-10xl Video Audio Distribution Amplifier Features

#	Feature	Function
10	*VIDEO IN* BNC Connector	Connects to the video source
11	*LOOP* BNC Connector	For looping to increase output availability
12	*TERM* Button	Pushing in selects 75Ω, releasing selects Hi-Z[2]
13	*COUPLING* Button	Pushing in selects DC coupling[3], releasing selects AC coupling (removing the DC offset of the input signal)
14	*VIDEO OUT* BNC Connectors	Connect to the video acceptors (from 1 to 10)
15	*AUDIO IN* RCA Connectors	Connects to the stereo audio source (R and L)
16	*AUDIO LOOP* RCA Connectors	For looping to increase audio output availability (R and L)
17	*AUDIO OUTPUTS* RCA Connectors	Connect to the stereo audio acceptors R and L, from 1 to 10)
18	Power Connector with Fuse	AC connector enabling power supply to the unit

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

2 For looping select Hi-Z

3 Achieving the best linearity and signal fidelity

5 Installing on a Rack

This section describes what to do before installing on a rack and how to rack mount.

Before Installing on a Rack

Before installing on a rack, be sure that the environment is within the recommended range:	
Operating temperature range	+5 to +45 Deg. Centigrade
Operating humidity range	5 to 65% RHL, non-condensing
Storage temperature range	-20 to +70 Deg. Centigrade
Storage humidity range	5 to 95% RHL, non-condensing

CAUTION!!

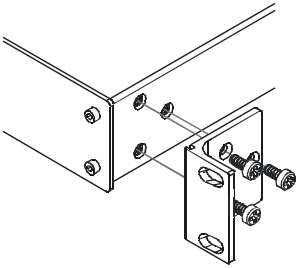
When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note that:

- **In some models, the front panel may feature built-in rack ears**
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions (you can download it at: http://www.kramerelectronics.com)

6 Using the VM-10xl Video Audio Distribution Amplifier

You can connect:

- A single **VM-10xl** unit (see section 6.1)
- Several **VM-10xl** units to increase the number of outputs (see section 6.2)

6.1 Connecting a VM-10xl Video Audio Distribution Amplifier

You can connect a single **VM-10xl** *Video Audio Distribution Amplifier* unit as a 1:10 video audio DA, in which audio is unbalanced stereo audio (left and right) or balanced mono audio (+ and -).

To connect the **VM-10xl** as a 1:10 video unbalanced stereo audio DA, as the example in Figure 2 illustrates, do the following[1]:

1. Connect a video audio source (for example, a composite video player) to the VIDEO IN BNC connector and to the left and right AUDIO IN RCA connectors.
2. Connect[2] the 10 VIDEO OUT BNC connectors and the 10 left and right AUDIO OUTPUT RCA connectors to the video audio acceptors[3] 1 to 10.
3. Connect the power cord to the mains electricity.
4. Push in the Term button to terminate the line to 75Ω.
5. Release the BAL/ST button to select unbalanced stereo audio operation.
6. If required, adjust[4] the video trimmer controls[5] for output signal level and/or cable compensation equalization level.
7. If audio control adjustment is required for left and/or right gain, push in Enable/Disable button, and then adjust[6] the trimmer controls.

1 Switch OFF the power on each device before connecting it to your VM-10xl. After connecting your VM-10xl, switch on its power and then switch on the power on each device

2 As required. Up to 10 outputs can be connected on the VM-10xl. Not all outputs need to be connected

3 For example, VCR units

4 Insert a screwdriver into the hole and carefully rotate it, to trim the level

5 The video outputs are arranged in two blocks of 5 outputs (outputs 1 to 5, and outputs 6 to 10). Each block can be separately trimmed for output level and cable equalization (EQ.) thus achieving different compensations for different cable lengths

6 Insert a screwdriver into the hole and carefully rotate it, to trim the level

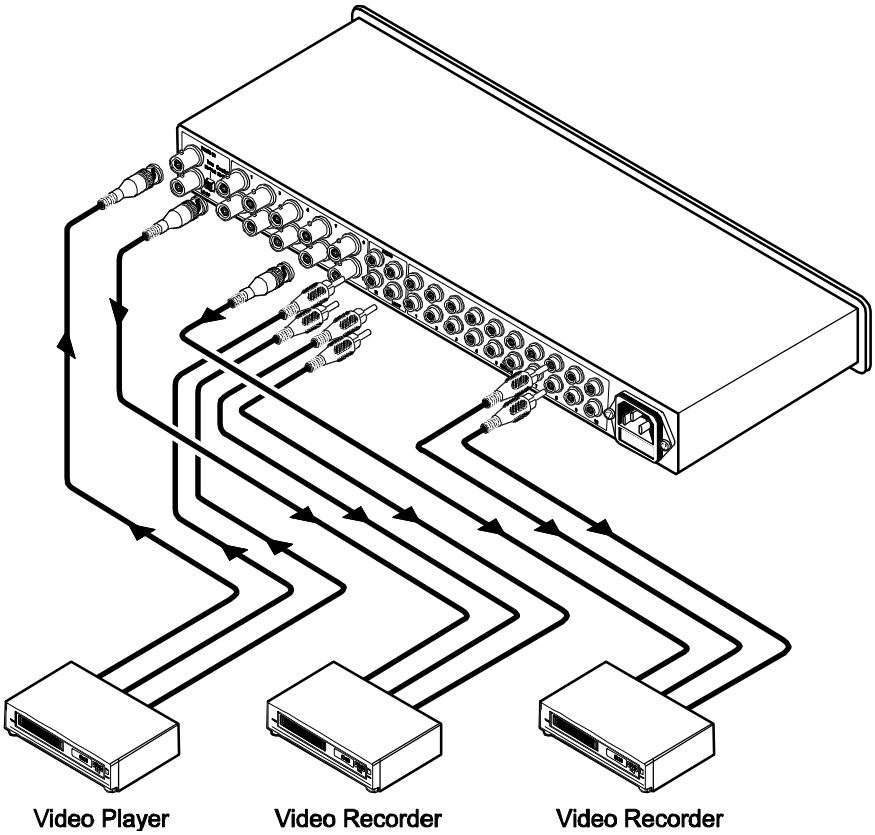


Figure 2: Connecting a single VM-10xl Video Audio Distribution Amplifier

6.2 Increasing the Outputs

You can increase the number of outputs by interconnecting **VM-10xl** units. The example in Figure 2 illustrates how to connect 3 units to increase the number of outputs from 10 to 30.

To form a 1:30 video and unbalanced stereo audio DA, do the following[1]:

1. Connect a video audio source (for example, a composite VCR) to the VIDEO IN BNC connector and to the left and right AUDIO IN RCA connectors of the first **VM-10xl** unit.
2. Connect the video LOOP BNC connector of the:
   - First **VM-10xl** unit to the VIDEO IN BNC connector of the second **VM-10xl** unit
   - Second **VM-10xl** unit to the VIDEO IN BNC connector of the third **VM-10xl** unit
3. Connect the left and right AUDIO LOOP RCA connectors of the:
   - First **VM-10xl** unit to the left and right AUDIO IN RCA connectors of the second **VM-10xl** unit
   - Second **VM-10xl** unit to the left and right AUDIO IN RCA connectors of the third **VM-10xl** unit
4. Connect the 10 VIDEO OUT BNC connectors and the 10 left and right AUDIO OUTPUT RCA connectors of the:
   - First **VM-10xl** unit to the video audio acceptors[2] 1 to 10
   - Second **VM-10xl** unit to the video audio acceptors[2] 11 to 20
   - Third **VM-10xl** unit to the video audio acceptors[2] 21 to 30
5. On the first and second **VM-10xl** units, release the Term button. On the third **VM-10xl** unit, push in the Term button to terminate the line to 75Ω.

1 Switch OFF the power on each device before connecting it to your VM-10xl units. After connecting the VM-10xl units, switch on their power and then switch on the power on each device

2 For example, VCR units

6. On each **VM-10xl** unit:
   - Connect the power cord to the mains electricity
   - Release the BAL/ST buttons to select unbalanced stereo audio operation
   - Adjust[1] the video trimmer controls[2] for output signal level and/or cable compensation equalization level, if required
   - If audio control adjustment is required for left and/or right gain, push in the Enable/Disable buttons, and then adjust[1] the trimmer controls

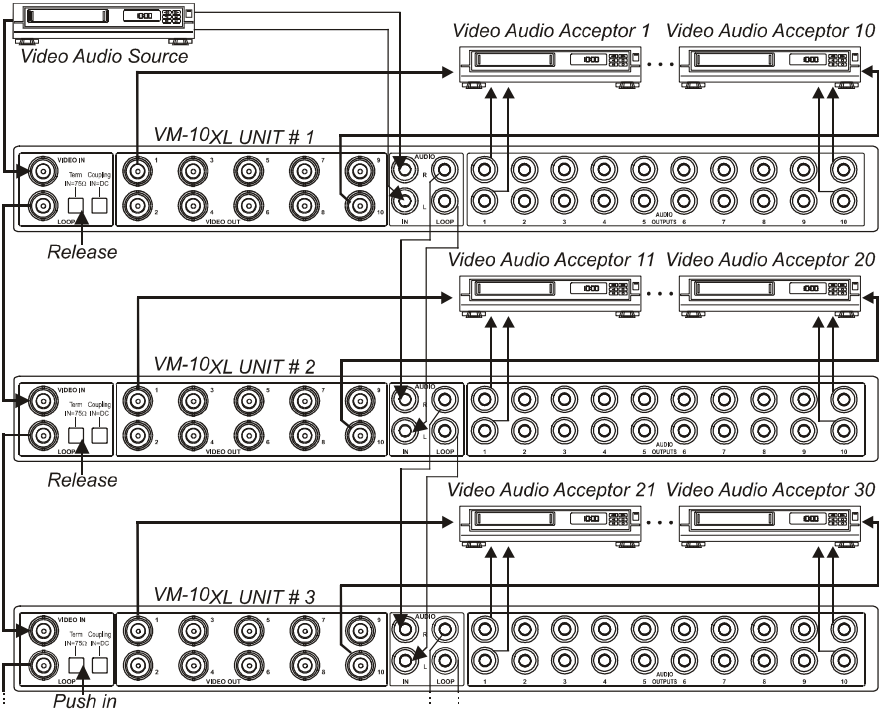


Figure 3: Increasing the Outputs: arranging a 1:30 Video Audio DA

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

2 The video outputs are arranged in two blocks of 5 outputs (outputs 1 to 5, and outputs 6 to 10). Each block can be separately trimmed for output level and cable equalization (EQ.) thus achieving different compensations for different cable lengths

7 Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical Specifications[1] of the VM-10xl Video Audio Distribution Amplifier

INPUTS:	1 composite video, 1 looping, 1Vpp/75Ω with termination switch on BNC connectors 2 audio, stereo or balanced mono, 2 looping, on RCA connectors	
OUTPUTS:	10 composite video, 1Vpp/75Ω on BNC connectors 10 audio, stereo or balanced mono, on RCA connectors	
MAX. OUTPUT LEVEL:	VIDEO: 1.6Vpp	AUDIO: 26.5Vpp
BANDWIDTH (-3dB):	VIDEO: 360MHz	AUDIO: >100kHz
DIFF. GAIN:	0.07%	
DIFF. PHASE:	0.05 Deg.	
K-FACTOR:	<0.05%	
S/N RATIO:	VIDEO: 77dB	AUDIO: 87dB
CONTROLS:	Front panel accessible trimmers for video level (-1.2dB to +6dB) and EQ. (0dB to +8.1dB), audio left and right control trimmers (0dB to +6dB), balanced/stereo selector switch and audio controls enable switch	
COUPLING:	VIDEO: DC/AC	AUDIO: AC
AUDIO THD + NOISE:	0.023%	
AUDIO 2nd HARMONIC:	0.001%	
POWER SOURCE:	230 VAC 50 / 60Hz (115V U.S.A.), 4.7VA	
DIMENSIONS:	19-inch (W), 7-inch (D), 1U (H)	
WEIGHT:	2.1kg (4.7lbs.) approx.	
ACCESSORIES:	Power cord	

1 Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
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P/N: 2900-001042 REV 3